

ABSTRACT OF THE DISCLOSURE

A modular electronic assembly for integration with a pneumatic tire includes a mounting patch, a power source, and at least one electronic device supported by a substrate. The mounting patch is preferably adapted for positioning on the inner liner of a pneumatic tire, and the power source is at least partially embedded in the mounting patch. Such embedded positioning of the battery results in an overall structure with a lower center of gravity than previous tire electronics assemblies, thus having increased mechanical stability and survivability in a tire environment. Electronic device(s) supported on the substrate may receive power from the power source, which in some embodiments corresponds to one or more batteries. The substrate supporting the at least one electronic device may be attached to the mounting patch by a variety of fashions. Exemplary attachment configurations may correspond to an adhesive layer, a hook and loop tape combination, or physical interconnection via terminals extending from the power source through the support substrate. Exemplary electronic devices may include such components as condition-responsive devices including transducers, acoustic devices, sensors, etc. for sensing certain environmental conditions such as temperature and/or pressure, tire revolution counters, vehicle speed sensors, sidewall deflection sensors, tire displacement sensors, microprocessors, memory modules, RFID transponders, light assemblies, data transmitters and/or receivers, and power supply components. Selected of the electronic devices (including one or more antennas associated with any RF devices) may be encapsulated by a non-conductive rubber or elastic material to facilitate effective transmission characteristics. Conductive springs, flexible conductive elastomer or fatigue-resistance metal may be used to interconnect various electronic components (such as an RF device to an antenna).